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ABSTRACT

Time production is an experimental paradigm that compares the accuracy with which a subject can produce a specified time interval relative to actual clock time. Higgins (1987) found that subjects perceived the passage of time as faster or slower, compared to actual time, as an interrelation of personality characteristics and experimental conditions. The present study investigated the relationship between time perception and Kirton's (1976) Adaption-Innovation Inventory (KAI), a measure of problem solving characteristics devised to locate respondents on a continuum ranging from adaptors to innovators. Adaptors manifest a conventional style of problem solving, seek group consensus, and work within established procedures, while innovators focus on new angles by restructuring in problem solving. Subjects were 22 college students who participated in a time production experiment and then completed the KAI. Significant correlations were found between time perception and the Originality subscale of the KAI ($p<.01$) and between time perception and the total KAI score ($p<.05$). The hypothesis that innovative subjects would perceive internal time as passing more rapidly than would adaptive subjects was supported. The Innovators' faster perception of internal time might be explained by the deeper levels of cognitive processing. This deeper processing of internal events could account for various problem solving styles that characterize Innovators. (Author/NB)

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Relationship Between Time Perception and Kirton's Adaption-Innovation Inventory

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Running head: Time Perception and KAI

Abstract

Higgins (1987) found that subjects perceive the passage of time as faster or slower, compared to actual time, as an interrelation of personality characteristics and experimental conditions. The present study investigated the relationship between time perception and Kirton's (1976) Adaption-Innovation Inventory (KAI), a measure of problem solving characteristics. Significant correlations were found between time perception and the Originality sub-scale of the KAI ($p < .01$) and between time perception and the total KAI score ($p < .05$). The hypothesis that more innovative subjects would perceive internal time as passing more rapidly was supported. The Innovators' faster perception of internal time might be explained by their deeper levels of cognitive processing. This deeper processing of internal events could account for various problem solving styles that characterize Innovators.

Relationship Between Time Perception and Kirton's Adaption-Innovation Inventory

Time production is an experimental paradigm that compares the accuracy with which a subject can produce a specified time interval relative to actual clock time. The method of production taps into internal timing processes without the access to external time cue stimuli. Frankenhaeusen (1959) suggested that time judgment by the method of production is based upon internal physiological events. Clausen (1950) and Frankenhaeusen (1959) stated that the method of production is the best method to use in investigating the relationship of time perception to internal physiological states.

Internal time perception is believed to be accelerated by arousal (Fraisse, 1963; Frankenhaeusen, 1959; Pieron, 1952). As subjects become more aroused, their internal perception of time is speeded up. In other words, an aroused subject would perceive internal time as passing more rapidly than actual clock time. Given a hypothetical situation, when asked to produce a time interval of say, three seconds, the aroused subject might conclude that three seconds had passed when only two seconds (actual clock time) had elapsed. Relationships of arousal to the perception of passage of internal time have been proposed to exist between individuals with different personaltiy characteristics, cognitive processing abilities, and sensory information processing.

Eysenck (1967) hypothesized that introverts experience a continually higher state of arousal than do extraverts. Allen (1984) suggested that creative individuals may perceive time differently while engaged in tasks which involve the right hemisphere of the brain. Ornstein (1969) has provided evidence that the subjective experience of time is based on the amount of sensory information processed during a given interval. As the number of stimuli increases, the perceived length of the interval increases. This data lends support to the event processing hypothesis that variations in time perception are related to variations in the rates of information processing (Coren, Porac, & Ward, 1984).

Higgins (1987) found that subjects perceive the passage of time as faster or slower, compared to actual clock time, as an interrelation of personality characteristics and experimental conditions. Based upon studies of the relationship between personality characteristics and information processing to time perception, 22 subjects from Higgins' (1987) experiment were given an additional paper and pencil instrument, the Kirton Adaption-Innovation Inventory (KAI) (Kirton, 1976). This instrument is purported to measure cognitive styles of problem solving.

Kirton (1976) observed dichotomous differences among entrepreneurs in cognitive styles of problem solving, creativity, and decision making. These managers seem to fall

into two groups: those who worked within the current system to improve it and those "men of ideas" with plans to change the existing system. Assuming that individuals could be placed on a continuum representing a personality dimension, Kirton (1976) developed his KAI.

The KAI is a measure devised to locate respondents on a continuum ranging from adaptors to innovators. Persons who respond to the KAI as habitual adaptors may be described as manifesting a conventional style of problem solving, seeking group consensus, and working within established procedures. While the adaptor seeks group consensus or conventionality in problem solving, the innovator, when confronted with a similar task, will attempt to focus on new angles by restructuring rather than working within existing structures. The innovator likes to do things better by doing them differently and has little regard for rules, conformity, and convergent thinking. Correlations between the KAI and other personality tests show the innovator as being more extraverted, flexible, and tolerant of ambiguity than the adaptor (Kirton, 1976).

The purpose of the present study was to investigate the relationship between time perception and Kirton's (1976) KAI. It was hypothesized that as subject's scores on the KAI increased above the mean of 96 (an indication of innovativeness), internal time would be perceived as passing more rapidly relative to actual clock time.

Method

Subjects

Subjects consisted of 22 undergraduate volunteers from psychology classes at East Texas State University. There were 11 males and 11 females in the sample. The instructors offered an incentive of extra credit points for the student's participation in the study.

Materials

A computer was used to measure the time production of each subject. All of the subjects were measured in the blue light experimental condition (see Higgins, 1987). A tape recorded message was used to provide the external stimulus cue. The instrument used to measure the cognitive problem solving style of the subjects was the KAI (Kirton, 1976).

Procedure

The 22 subjects in this study were tested as an adjunct to part of a time production experiment by Higgins (1987). All 22 subjects reported to the East Texas State University Psychology Lab where they were individually tested. The experimenter asked the subjects to gaze at a screen upon which a blue light was focused and listen to a set of tape recorded instructions.

The subjects were asked to produce 16 different time intervals ranging from 3-18 seconds. When instructed by the tape to start, subjects began estimating the requested time

interval. Subjects pressed a raised key on a covered computer keyboard when they judged the requested time interval had passed. Recorded and measured to the nearest 100th of a second by the computer, each subject's time score was represented by the average of produced time divided by standard (actual clock time).

After these 22 subjects had completed their participation in Higgins' (1987) experiment on time production, they were contacted and asked to take the KAI (Kirton, 1976). The KAI is a paper and pencil instrument requiring 10-15 minutes to administer. After computer scoring, a total KAI score and three subscale scores (Originality, Efficiency, Rule Group Conformity) were obtained for each subject.

Results

A Pearson product-moment correlation was used to test the research hypothesis. Probabilities were tested using a one-tailed t test. There was a significant negative correlation between the time score and total KAI score ($r = -.40$, $p < .05$). A signficant negative correlation between the time score and the KAI Originality subscale was also obtained ($r = -.50$, $p < .01$).

Discussion

As time scores decreased, total KAI and Originality subscale scores increased. Higher KAI scores, above the mean of 96 to an upper limit of 160, indicate Innovators. Those

scores below the mean to 32 indicate Adaptors. The data support the hypothesis that more innovative people tend to perceive internal time as passing more rapidly than adaptors.

When asked to produce a time interval of say, 3 seconds, Innovators tended to perceive internal time as passing more rapidly, when compared to actual clock time, than Adaptors. The Innovators might judge an elapse of 3 seconds when only 2 seconds (actual clock time) had passed.

One interpretation of the data is that Innovators may process a greater number of thought events than Adaptors do. This profusion of ideas might help to explain various problem solving styles that characterize Innovators.

Innovators are seen as undisciplined, moving from task to task, becoming bored with detailed, methodical work (Kirton, 1976). An explanation for this could be that they approach a task, discover a solution, become restless, and move on to another task. The faster processing of internal events could account for this restlessness and faster perception of internal time.

Innovators approach problems tangentially and seek divergent solutions. Seldom satisfied with "pat solutions," Innovators toy with ideas to discover problems and avenues of solutions. In other words, Innovators like to do things better by doing them differently (Kirton, 1976).

The Originality subscale describes many chracteristics

of the Innovator and was theoretically derived from Rogers' (1959) idea of the "creative loner" by Kirton (1976). As Originality scores increased, time scores decreased. Subjects who scored higher on this subscale (and generally higher on the total KAI score) tended to perceive internal time as passing more rapidly. Taken that the Originality subscale is measuring a different type of creativity between Adaptors and Innovators (Kirton, 1982), this seems to support Allen's (1984) notion that creative people may perceive time differently.

The idea of time perception has fascinated man for centuries. This study examined the relationship between time perception and the KAI. Innovators may proliferate more ideas in their manner of information-processing than Adaptors. This might lead to more restlessness with routine tasks and a need to accomplish more in a different way. If innovative people do perceive internal time as passing more rapidly, future research into their levels of cognitive processing may support the explanation given by this study.

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